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EXAMINER

GILLIS, BRIAN J

ART UNIT PAPER NUMBER

2141

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/033,404  
Filing Date: December 27, 2001  
Appellant(s): MOGUL ET AL.

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Timothy Kang  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed August 28, 2006 appealing from the Office action mailed April 26, 2006.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

**WITHDRAWN REJECTIONS**

The following grounds of rejection are not presented for review on appeal because they have been withdrawn by the examiner. Whether claims 1-10 and 37 are directed towards non-statutory subject matter under 35 U.S.C. 101.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,728,840	Shatil et al	4-2004
2002/0103778	Saxena	8-2002
6,085,193	Malkin et al	7-2000
6,173,392	Shinozaki	1-2001

**(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-31 and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shatil et al (US Patent #6,728,840) in view of Saxena (US PG PUB #US2002/0103778).

Claims 1, 11 and 21 disclose a computer program product, method and system for performing energy efficient data prefetching in conjunction with a client computer system comprising of a prefetch prediction model and engine, and instructions for storing and fetching files in a queue. Shatil et al teaches of a prefetch prediction model, prefetch prediction engine and instructions for storing prefetched files in a queue (column 12, lines 10-17, 26-30, column 13, lines 10-15, 40-44). It fails to teach of fetching the files prefetched from a queue. Saxena teaches of storing prefetched files in

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a cache and when requested sending the file to the client from the cache (paragraph 42, lines 6-18, paragraph 43, lines 1-5).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the storing and retrieving prefetched files method in Saxena with the prefetch prediction model and engine in Shatil et al because prefetching of web pages can provide a user increased performance (Saxena, paragraph 6, lines 8-11).

Claims 2, 12, and 22 disclose the computer program product, method and system of claims 1, 11, and 21 including a model updater, for updating the energy usage parameters of the prefetch prediction model in accordance with results of past prefetch decisions. Shatil et al teaches of a prefetch prediction model, prefetch prediction engine and instructions for storing prefetched files in a queue, and a prefetch optimizer for modifying the prefetch database in response to analysis of cache feedback (column 12, lines 10-17, 26-30, column 13, lines 10-15, 40-44, column 19, lines 40-45). It fails to teach of fetching the files prefetched from a queue. Saxena teaches of storing prefetched files in a cache and when requested sending the file to the client from the cache (paragraph 42, lines 6-18, paragraph 43, lines 1-5).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the storing and retrieving prefetched files method in Saxena with

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the model, engine, and optimizer in Shatil et al because prefetching of web pages can provide a user increased performance (Saxena, paragraph 6, lines 8-11).

Claims 3, 4, 13, 14, 23, and 24 disclose the computer program product, method and system of claims 1, 11, and 21, wherein the prefetch criteria include criteria that are a function of a current energy supply level and cache fullness of the client computer system. Shatil teaches of a prefetch prediction model and engine, and using various criteria to prefetch files (column 12 lines 26-30, column 13, lines 10-15, column 15, lines 10-18, 27-32, 55-59). It fails to teach of fetching the files prefetched from a queue. Saxena teaches of storing prefetched files in a cache and when requested sending the file to the client from the cache (paragraph 42, lines 6-18, paragraph 43, lines 1-5).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the storing and retrieving prefetched files method in Saxena with the model, engine, and prefetch lookup process in Shatil et al because it significantly increases the optimal use of cache memory systems within data storage systems which increases overall system performance (Shatil et al, column 12, lines 41-44).

Claims 5, 15, and 25 disclose the computer program product, method, and system of claim 1, 11 and 21 including receiving a message from a server that includes information identifying at least one of the specified files. Shatil et al teaches of a prefetch prediction model and engine (column 12, lines 26-30, column 13, lines 10-15). It fails to teach of one of the specified files being identified in a message received from

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the server. Saxena teaches of logs of an origin server containing information of prefetched files already retrieved (paragraph 37, lines 1-8).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the logs of the origin server in Saxena with the prediction model and engine of Shatil et al because this helps the prefetch module to prefetch important web pages so users experience increased performance with respect to portions of the origin server (Saxena, paragraph 32, lines 6-9).

Claims 6, 16, and 26 disclose the computer program product, method and system of claims 1, 11, and 21 including the executing of the at least one application including identifying at least one of the specified files. Shatil teaches of a prefetch prediction model and engine (column 12, lines 26-30, column 13, lines 10-15). It fails to teach of an application identifying the prefetched file. Saxena teaches of the web pages being linked to a retrieved web page in the browser. It is widely known in the art that a web page may have links to other web pages that allow a user to view the linked web page (paragraph 48, lines 3-6).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the linked web pages in Saxena with the prediction model and engine of Shatil et al because this helps the prefetch module to prefetch important web

pages so users can experience increased performance with respect to portions of the origin server (Saxena, paragraph 32, lines 6-9).

Claims 7, 17, and 27 disclose the computer program product, method and system of claims 1, 16, and 21 further comprising of storing in a fetch queue entries identifying the files specified by the at least one application program to be fetched; and scheduling downloading of files identified by entries in the fetch queue and files identified by entries in the prefetch queue, giving priority to the files identified by the entries in the fetch queue. Shatil teaches of a prefetch prediction model and engine (column 12, lines 26-30, column 13, lines 10-15). It fails to teach of storing of queue entries identified by the application program to be fetched and a scheduler for scheduling of the downloading of files. Saxena et al teaches of a prefetch module, which determines whether related web pages are already cached and may retrieved one of the uncached pages. Saxena also teaches of the prefetch module using a graph of prefetched pages to adjust priority (paragraph 26, lines 5-9, paragraph 27, lines 1-6).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the prefetch module in Saxena with the prefetch prediction model and engine in Shatil et al because this provides increased service to users requesting higher priority web pages (Saxena, paragraph 26, lines 7-9).

Claims 8, 18, and 28 disclose the computer program product, method and system of claims 7, 17, and 27 further comprising: determining whether to download a



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file identified by an entry in the prefetch queue in accordance with various predefined scheduling criteria. Shatil teaches of a prefetch prediction model and engine (column 12, lines 26-30, column 13, lines 10-15). It fails to teach of a scheduler to download files in a prefetch queue according to various criteria. Saxena teaches of a graph, which is a logical construct that allows pages to be scheduled bases on relative weighting of relationships between web pages on a server (column 19, lines 8-10).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the graph in Saxena with the prefetch prediction model and engine in Shatil et al because prefetching of web pages can provide a user increased performance (Saxena, paragraph 6, lines 8-11).

Claims 9, 19, and 29 disclose the computer program product, method and system of claims 1, 11, and 21 further comprising: re-evaluating entries in the queue and flushing from the queue any entries in the queue deselected by the re-evaluating. Shatil et al teaches of a prefetch prediction model and engine (column 12, lines 26-30, column 13, lines 10-15). It fails to teach of re-evaluating and flushing the queue of any unnecessary entries. Saxena teaches of a prefetch threshold, which may change, based on the current load the server is experiencing and disregards the lower priority requests (paragraph 40, lines 6-21).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the prefetch threshold in Saxena with the prefetch prediction model and engine in Shatil et al because by decreasing the number of web pages being prefetched the processing load at the cache server may decrease (Saxena, paragraph 40, lines 12-15).

Claims 10, 20, and 31 disclose the computer program product, method and system of claims 1, 11, and 21 including a model updater, for updating the energy usage parameters of the prefetch prediction model in accordance with energy usage statistics. Shatil et al teaches of a prefetch prediction model, prefetch prediction engine and instructions for storing prefetched files in a queue, and a prefetch optimizer for modifying the prefetch database in response to analysis of cache feedback (column 12, lines 10-17, 26-30, column 13, lines 10-15, 40-44, column 19, lines 40-45). It fails to teach of fetching the files prefetched from a queue. Saxena teaches of storing prefetched files in a cache and when requested sending the file to the client from the cache (paragraph 42, lines 6-18, paragraph 43, lines 1-5).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the storing and retrieving prefetched files method in Saxena with the model, engine, and optimizer in Shatil et al because prefetching of web pages can provide a user increased performance (Saxena, paragraph 6, lines 8-11).

Claim 30 discloses the computer system of claim 21, including a queue pruner, executable by the at least one processing unit, including queue pruning instructions for prioritizing the entries in the queue and for removing from the queue a first entry identifying a previously specified file for which the prefetch prediction engine generated an affirmative prefetch decision, where said first entry is assigned a lower priority than a second entry in the queue. Shatil et al teaches of a prefetch prediction model and engine (column 12, lines 26-30, column 13, lines 10-15). It fails to teach of queue pruning instructions for prioritizing entries in the queue. Saxena teaches of a prefetch threshold, which can prioritize web pages based on the transaction weight of the page. This can allow a file that is first in the cache to be assigned a lower priority than the second file (paragraph 40, lines 6-21).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the prefetch threshold in Saxena with the prefetch prediction model and engine in Shatil et al because by decreasing the number of web pages being prefetched the processing load at the cache server may decrease (Saxena, paragraph 40, lines 12-15).

Claims 37, 38, and 39 disclose a computer program product, method, and computer system for performing energy efficient data prefetching in conjunction with a client computer system. Shatil et al teaches of a prefetch prediction engine (column 13, lines 10-15). It fails to teach of a prefetch prediction model based on cost parameters

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and instructions for storing and fetching files in a queue. Saxena teaches of using transaction weight to determine the importance of web pages when cost parameters are required (paragraph 32, lines 2-15). It also teaches of storing prefetched files in a cache and when requested sending the file to the client from the cache (paragraph 42, lines 6-18, paragraph 43, lines 1-5).

Shatil et al and Saxena are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the storing and retrieving prefetched files method in Saxena with the prefetch prediction model and engine in Shatil et al because prefetching of web pages can provide a user increased performance (Saxena, paragraph 6, lines 8-11).

Claims 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malkin et al (US Patent #6,085,193) in view of Shatil et al (US Patent #6,728,840).

Claim 32 discloses a computer system comprising: at least one processing unit for executing procedures containing executable instructions; a server module, executable by the at least one processing unit, for responding to a request from a client computer for a specified file and for generating a reply to the request, the reply including a content portion comprising the specified file; and a prefetch predictor, executable by the at least one processing unit, for identifying additional files for possible prefetching by the client computer, wherein criteria for identifying includes energy efficiency criteria; the server module including instructions for including in a supplemental portion of the reply to the request from the client computer prefetch hint information identifying at least one

of the additional files, wherein the supplemental portion is distinct from the content portion of the reply. Malkin et al teaches of a data processing system including a server which can run computer executable code (column 6, lines 15-20), a server responds to a request and then processes a response to the client (column 8, lines 38-45), a server generating prefetch hint information on related accesses to the requested information (column 8, lines 41-45), and a server attaches prefetch hint information as meta data piggy backed with the requested information (column 8, lines 41-45). It fails to teach of using energy efficiency criteria. Shatil et al teaches of using various types of criteria to allow access to files (column 11, lines 48-58, column 16, line 56 – column 17, line 8).

Malkin et al and Shatil et al are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the criteria in Shatil et al with the system in Malkin et al because cache memory use is significantly increased which increases overall system performance (Shatil et al, column 12, lines 40-43).

Claim 33 discloses the computer system of claim 32, wherein the prefetch hint information includes predicted prefetch probability information for at least one of the identified additional files. Malkin et al further teaches the prefetched hint information includes probability information (column 12, lines 55-67-column 13, lines 1-6).

Claim 34 discloses the computer system of claim 32, wherein the prefetch hint information includes meta information for at least one of the identified additional files, the meta information selected from the group consisting of file size information, file type

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information and information indicating a specific relationship to the specified file in the content portion of the reply. Malkin et al further teaches the prefetch hint information is piggy backed as meta data, which is widely known in the art to consist of various types of information (column 8, lines 42-45).

Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Malkin et al (US Patent #6,085,193) in view of Shatil et al (US Patent #6,728,840) as applied to claim 32 above, and further in view of Shinozaki (US Patent #6,173,392).

Claim 35 discloses the computer system of claim 32, wherein the prefetch hint information includes an initial additional set of files, the computer system further comprising a pruner, for selectively removing at least one file of the initial additional set of files. Malkin et al in view of Shatil et al teaches of the limitations of claim 32 as recited above (column 6, lines 15-20, column 8, lines 38-45). It fails to teach of a pruner, which can remove, files form an additional set of files. Shinozaki et al teaches of a canceller, which can cancel prefetch requests for the additional files to prevent less urgent requests from being prefetched (column 5, lines 60-67, column 6, lines 1-3, 24-29).

Malkin et al in view of Shatil et al and Shinozaki are analogous art because they are both related to data prefetching.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the canceller in Shinozaki with the system in Malkin et al in view of Shatil et al because the canceller prevents less urgent data to be prefetched increasing overall system performance (Shinozaki, column 6, lines 27-29).

Claim 36 discloses the computer system of claim 35, further comprising a prefetch efficiency model, including prefetch efficiency parameters for predicting an impact on energy usage by the client computer that would result from prefetching specified files, coupled to the pruner, the pruner utilizing the prefetch efficiency model to selectively remove the at least one file of the initial additional set of files. Malkin et al further teaches of a prefetching unit, which takes into consideration the impact of storing the object (figure 8, column 15, lines 61-67- column 16, lines 1-8).

**(10) Response to Argument**

Claims 1-31

(A) Applicant asserts on pages 8-9 the prior art does not teach of "energy usage parameters".

As to point (A), Shatil et al teaches of comparing access data against prefetch criteria, which can include various types of data including energy efficiency data and is not limited and does not exclude any types of possible criteria including energy usage parameters (column 11, lines 48-58, column 16, line 55 – column 17, line 8). Shatil et al further teaches of using the prefetch criteria to compare requests for access to data to govern caching operations for one or more applications or programs that perform within the host computer system (column 12, lines 23-30).

Claims 37-39

(B) Applicant asserts on pages 9-11 the prior art does not teach of "cost parameters for predicting an impact on monetary charges incurred by the client computers system" and "cost efficiency prefetch criteria".

As to point (B), Saxena teaches of a using transaction weight feature, which may comprise of a numeric or other indication of weight, which is widely known to include various indicators including cost (paragraph 29). Saxena teaches of using the transaction weight feature to restrict the prefetching of web pages since the client in this case the origin server is paying for the services from the cache server and would like to reduce cost (paragraph 32). It is widely known in the art charges to a client are related to the costs a server incurs in providing a service to the client. Saxena further teaches of historical information is stored and is able to be used in determining which pages are to be retrieved (paragraph 37).

#### Claims 32-34

(C) Applicant asserts on pages 11-12 the prior art does not teach of "energy efficient criteria".

As to point (C) Shatil et al teaches of comparing access data against prefetch criteria, which can included various types of data including energy efficiency data and is not limited and does not exclude any types of possible criteria including energy usage (column 11, lines 48-58, column 16, line 55 – column 17, line 8). Shatil et al further teaches of using the prefetch criteria to compare requests for access to data to govern caching operations for one or more applications or programs that perform within the host computer system (column 12, lines 23-30).

#### Claims 35 and 36

(D) Applicant asserts on pages 12-13 the prior art fails to teach of energy efficient criteria.



As to point (D) the grounds of rejection in the Final Action mailed April 26, 2006 contains a typographical error and claims 35 and 36 are rejected over Malkin et al in view of Shatil et al as applied to claim 32 above and further in view of Shinozaki. Malkin et al in view of Shatil et al in view of Shinozaki teaches of comparing access data against prefetch criteria, which can included various types of data including energy efficiency data and is not limited and does not exclude any types of possible criteria including energy usage parameters (column 11, lines 48-58, column 16, line 55 – column 17, line 8). Shatil et al further teaches of using the prefetch criteria to compare requests for access to data to govern caching operations for one or more applications or programs that perform within the host computer system (column 12, lines 23-30).

**(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.


For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Brian Gillis  
Examiner  
Art Unit 2141  
BJG



Conferees:



RUPAL DHARIA  
SUPERVISORY PATENT EXAMINER



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